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Assessing and building innovation and learning capacity in local organizations

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Abstract

Conceptual models of regional innovation systems have prompted major government initiatives in Europe and North America to assess and to promote local innovation and learning capabilities. In Australia, by contrast, local governments and other local organizations concerned with economic and social development are faltering. Lacking is (1) a conceptual understanding of local knowledge and innovation networks; (2) data on local innovation actors and activities; and (3) clarity on the most effective ways for municipal and regional government to 'construct advantage' in a federal system. The paper reviews the 'macro' (e.g. innovation surveys) and 'micro' (e.g. case studies) approach to assessing the capability of regional innovation systems. The paper then reports work in progress to develop a more 'meso' approach, first to further develop a classification of the local 'assets' and 'actors' involved in constructing local advantage. Second, we outline a proposal to apply this classification for mapping and measuring the 'supply chain' for constructing advantage in a particular region – Wollongong, New South Wales.

1. Introduction: 'glocalisation' - the importance of location and place

Location, location, location! As real estate agents remind us, where we live is of prime importance. Paradoxically, the significance of 'place' is enhanced in a global knowledge economy, through a process of what has been called 'glocalisation'. This has weakened the power of national level governments and organisations but opened up new opportunities for cities and regions to display their talents on the world stage (Ohmae, 1995). As Keating, Loughlin, & Deschouwer (2003) observe, regions have become the *subject* of policy by national governments as opposed to the subservient

object of policy. In many cases they have derived advantage from unique local intangible assets such as history, language and culture.

This paper first reviews the factors that have led to this 'new regionalism' (see Keating et al., 2003). It describes in both theoretical and practical terms some of the ways that the main 'actors' – firms, governments, universities – can collaborate to create and enhance thriving and internationally competitive innovation regions. It then discusses the specific problems of constructing local advantage in Australia, and outlines work in progress to assess and enhance the capacity for building advantage in a particular part of Australia: Wollongong and the Illawarra region of New South Wales.

'Glocalisation' is an imprecise concept. Some authors use it to describe the process of acculturation through the adoption or rejection of 'foreign' cultures; or conversely of tailoring goods and services to local requirements; or simply in relation to local specialisation in a global economy (Postmaa & Liebl, 2005). I do not use it in these senses; although I stress the significance of local culture as a competitive element of innovative regions: the idea, as Keating et al. (2003) put it, that 'in the new conditions of production, a distinct local culture might be an asset for development and a means of coping with globalisation' (p. 3).

Two elements of glocalisation are identified by Swyngedouw (2004) which are especially relevant. First, economic activities are becoming both more localised and transnational. Even the smallest firms can enter international supply chains and markets. In relation to Silicon Valley, Calif., the small scale producers in the so called

‘Third Italy’ regions (small firms in central Italy), and the financial services industries in Manhattan and the City of London, Swyngedouw (2004) talks of ‘intense territorial concentration combined with a global reach and outlook’.

Second, institutional arrangements and regulation at the national level are becoming devolved upwards to supranational bodies and arrangements (from the EU to WTO), and downwards to regional, metropolitan or local government and agencies (Swyngedouw, 2004). In some countries – but not in Australia with its 19th century federal constitution - this has driven political devolution to new regional tiers of government. National governments are losing their pre-eminent power – especially in Europe – but in Australia too, as can be seen from the inability to insulate the country from the collapse of international speculative financial markets.

The first observation of the paper therefore is that ‘new regionalism’ and ‘glocalisation’ provides a new opportunity for a broad range of local firms and organisations to influence the economic and social development and direction of a region. This provides an emerging opportunity to influence economic, social, political and environmental developments at the local level. This opportunity is open to a range of local ‘actors’, from commercial companies, educational institutions – especially universities and research agencies - various levels of government, and a panoply of non-government and intermediary organisations within the society. Regional development is not determined solely by global economics, by national government, nor by local players, but by the interplay of each of these.

1.1 Research questions

This raises the broad question of how local governments and communities can effectively intervene to promote knowledge and innovation based economic and social development in their region. How can they assess the capabilities in their own regions? What organizations and groups in the local community are important to the process and need to be involved? What initiatives should councils take? How can local council initiatives intersect and gain support from actions by government at the state and federal level?

Wollongong, like many cities around the world, is branding itself a 'city of innovation' and actively attempting to 'construct advantage' in the local region. However, like other regions in Australia, the city is grappling with the challenges of marshalling local players towards these ends. One of the key issues is the role of different levels of institution and governance – the federal, state and local. By contrast with regional devolution elsewhere, local governments and other local organizations in Australia concerned with economic and social development are faltering. We see a lack of power at the local level, and a lack of coordination between players, and as a consequence a paralysis in addressing the opportunities of the new regionalism. Lacking is (1) a conceptual understanding of local knowledge and innovation networks; (2) data on local innovation actors and activities; and (3) clarity on the most effective ways for municipal and regional government to intervene to 'construct advantage' in a federal system.

Later in the paper we discuss the range of organisational players and their appropriate roles. First however it is useful to introduce the specific situation of Wollongong, and

then to consider the factors that contribute to competitive advantage and innovation at the local level and thus what we mean by 'innovative regions'. We then review some of the methods used to assess the capacity of innovative regions, and propose a new framework for analysis. Lastly we consider how this framework might be applied to the specific case of Wollongong.

2. Wollongong: 'City of Innovation'

In Australia, the local council in Wollongong, New South Wales, has asserted its place in the new economy by branding itself a 'city of innovation'. Located in the Illawarra Region approximately 80 kilometres south of Sydney, Wollongong is the third largest local government area in NSW by population (est. 192,000 in 2006) (Australian Bureau of Statistics, 2007); with the neighbouring Shellharbour and Kiama municipalities bringing the total regional population to around 275,000. For most of the 20th century the city had a dominant industrial base with a large steelworks located south of the city centre at Port Kembla. By the 1980s the steelworks was being rationalised shedding labour from a work-force of 22,000 to less than 7,000 (Watson, 1991). The local coal mines also were succumbing to economic pressures and introducing technological advances which required less labour. In addition to economic downturn, the City of Wollongong was the butt of negative media stories. The Wollongong Image Strategy (Valerio, Baker, & Gulloch, 1999) reported a wide range of negative articles relating to crime, heavy industry, industrial unrest, pollution and floods. More recently, in March 2008, the elected Council was replaced by administrators appointed by the State government on the grounds of what the minister termed 'systemic corruption' following an independent commission's

inquiry into irregular practices by elected and public officials surrounding the approval of business development applications (DA).

The seriousness of the industrial decline and the negative image of the city prompted the Wollongong City Council to fund a 'city image campaign' and allocate $2.5 million over a 5 year period for this purpose. As a result of extensive research by consultants and with the consent of the council, the city declared itself a 'City of Innovation' in June 1999 (Garrett-Jones, Gross, Kerr, Kotevski, & Zaeemdar, 2007). A consultants' report (Valerio et al., 1999) explained why innovation was the recommended positioning strategy, claiming that 'Wollongong's innovative credentials …go back to the early days of its history'. The formulation of Wollongong's new image involved a wide range of stakeholders including professional consultants, representatives from the city council, the university, the business chamber, the steelworks, and individual businesses. Like similar strategies in other 'smart cities' it was forward-looking, even visionary, but equally importantly was built upon a foundation of past community history, character, culture and human and organisational resources – broadly speaking, the city's 'social capital' and individuals' education and cultural capital.

The city has set its sights on attracting knowledge-based services as well as building on its traditional strength of steel manufacturing and engineering and as a regional service economy; to sell itself as 'a regional city with the advantages of a capital' (Wollongong City Council, 2008). It builds on the initiatives of other regional players, like the University of Wollongong's Innovation Campus (Buchan Consultants, 2006). The Council itself is committed to continually improving the quality of its services,

being innovative and creative and working with the community (Wollongong City Council, 2009). To improve collaboration at the policy level the city has established 'Advantage Wollongong', a forum with members drawn from a range of business, industry, government and educational groups in the region (Table 1).

Marceau (2008) sees two related aspects of innovative cities. First is the city as *home for innovative businesses*, industries and people that will promote economic development. Second is in the *innovative operation and provision* by public authorities of *city services and governance* for reasons of efficiency, sustainability, participative democracy and social inclusion, equity etc. This may lead to innovative social partnerships, environmental or technological solutions (such as e- or m-services). Clearly, these are two sides of the same coin. Wollongong is setting its sights on both.

Wollongong faces significant challenges in its transition to an innovative, learning region. Its proximity to metropolitan Sydney is both an opportunity and a threat, with many skilled workers commuting to Sydney. Its heritage of heavy industry and infrastructure shapes current structures for collaboration. A survey of small firms carried out in 1999-2000 found that innovation predominantly involved vertical collaboration with suppliers and customers along the value chain. There seemed to be barriers to horizontal collaboration with universities and other knowledge institutions (Turpin & Garrett-Jones, 2002). Lastly, local government is working within a system of governance which has been described in a similar context as 'fragmented and incoherent' (Parker & Tamaschke, 2005, p. 1803), in relation to its influence over business and in relation to effective coordination of different levels of government.

3. ‘Constructing advantage’

3.1. Competitive advantage - From material factors to knowledge factors

Throughout human history, permanent settlements have been located to take advantage of natural endowments (good defensive position, climate, food sources, good soils for agriculture, timber and minerals etc) and access to trade and transport routes. In the industrial era, a region’s access to raw materials, labour, capital and capital goods determined its economic success, which was jeopardised if natural resources or materials became exhausted. Competitive advantage could be ‘constructed’, over time, for example through hard infrastructure and ‘industrialisation’: the concentration of industrial firms and accumulation of capital plant in heavy industry, automobiles etc. This was an expensive and inflexible process, leaving regions heavily dependent on a few dominant industries.

While these traditional factors of industrial location remain important, increasingly the economy is driven by knowledge work: finance and business services, education, research, and other personal and knowledge-based services. As de La Mothe & Mallory (2006, p. 24) put it, economic advantage in today’s knowledge economy is based not on what one has (the material factors of industrial production) but on ‘what we think and do’. In other words, knowledge is now a central factor of production. It involves knowledge creation (from universities and business), the economic rise of intangible goods and services and exchange of knowledge for example through cross-sector research collaboration.

3.2. Elements of constructed advantage

What de La Mothe et al. (2006) show is that 'constructed advantage' is a process of building on and expanding social capital – skills, organisations and networks. They recognise a need to 'engage local industries, university instructors, higher education leaders, not-for profit organizations, youth groups.' (p. 32) … and note that 'creating communities and economic advantage is a "full contact sport" and not a dry policy making exercise. For innovation and growth to occur, a region or a city needs collaborative relationships' (de La Mothe et al., 2006). The role of government then becomes 'backing local leaders' (de La Mothe et al., 2006). Thus 'constructed advantage' achieves value as a local factor of production through 'profoundly collaborative, socially interactive processes' that lead to communication and learning (Cooke & Morgan, 1998, p. 8).

This implies a much greater role for local institutions and organisations, including a wider range of intermediary organisations than is implied by the standard 'model' of national or regional innovation systems, even that promulgated by the Innovating Regions Europe program (Figure 1). As Keating et al. (2003) point out, there must be a sufficient institutional framework for regional development: what Amin & Thrift (1994) call 'institutional thickness'. To be effective these institutions must 'interact, foster coalition-building, and sustain a common enterprise' (Keating et al., 2003, p. 24, quoting Amin et al., 1994), otherwise a density of institutions will simply add to transaction costs and potentially conflicting actions. An attractive approach to assessing the local networking 'associationalism' – or counting the number and form of associations – thus runs into the problem of 'functional and dysfunctional forms of

associationalism' and of the relative effectiveness of formal associations and informal networks (Keating et al., 2003, p. 25).

If local institutions are the fabric of innovative regions, then the 'glue' is social capital. Social capital is a loosely defined concept: it may refer to institutions or cultural norms or both.[1] At its simplest it equates to 'networks' and 'trust' and possibly 'shared culture'. Keating et al. (2003) and Tamaschke (2003) point to some of the problems of assessing social capital in the context of regional development. One of these is that the level of trust between parties can vary with the context and the nature of the activity being carried out.

3.3 Path dependency – The importance of history

If the first lesson of local innovation studies is that 'geography still matters' - Kevin Morgan (2004) talks of the 'exaggerated death of geography' - the second is that 'history matters'. Geography matters firstly because proximity is important in developing trustful networks, and second because regions carry endowments of social capital, cultures, skills and knowledge that can be exploited for future economic and social development. Thus culture becomes 'a common frame of reference, an understanding of the membership of society which might underpin a common project' (Keating et al., 2003, p. 35); and territory thus 'refers to the whole pattern of social and economic relationships, conventions and cultures, which together make up the distinct milieu[2] of each place' (Keating et al., 2003, p. 17). On the other hand, local 'actors' have to work within the institutions (forms of accepted organisation or way of

[1] Cooke's (2002) definition is as good as any: 'trustful, reciprocal networking through professional, civic and cultural associations' as 'a means of securing full civic engagement and sharing of common problems and issues'.

[2] *Milieu:* 'The physical or social setting in which something occurs or develops' (Merriam Webster Dictionary).

behaviour) available to them, which are partly a function of history. Their actions are shaped and constrained by the norms and capabilities of the institutions. Local characteristics, such as culture, regional identity and language, may be of crucial importance in driving local innovation and learning, but they act as both an opportunity and a constraint.

3.4 What makes a region innovative?

What emerges is that local economic advantage is an artifice, and a dynamic artifice at that. It blends comparative and competitive advantage increasingly with what has been termed 'constructed' advantage. 'Constructed advantage' is not only increasingly valuable, but is, by definition, open to influence and construction by local actors.

These, then, are the new building blocks of regional advantage. A region which is rich in these competitive advantages might be classed as an innovative region. Initially the term was applied rather narrowly to regions, like Silicon Valley, California, that were leaders in science-based technological innovation in emerging industries like microelectronics or biotechnology. The OECD now admits a broader definition (OECD, 2008) with 'lagging' regions such as Georgia, USA, and northern England acting to transform their economies. As the OECD notes, 'one of the vehicles commonly used to achieve these goals is to support "clusters" (concentrations of firms and supporting actors) in a particular region' (OECD, 2007, p. 1).

The concept of innovative regions in this view is an extension of 'national innovation systems' (NIS) model with commercial enterprises securely in the driving seat. Many

other actors – universities, financiers, and the legal system – essentially 'support' the enterprise in its competitive quest. This cradle or incubator model is fine as long as the enterprise thrives, but is less well equipped to deal with crisis or decline where the 'next' industries are yet to be identified or emerge. Here what is required is more of a 'fertile field' model, where enterprise can emerge unanticipated from a range of sources. In some places, 'the public authority side may be 'miles ahead while in other innovation is pushed by companies powering ahead' (Marceau, 2008, p. 138; Todtling & Kaufmann, 1999; Todtling & Trippl, 2005). The strategy may be to create an environment that is attractive for firms and skilled workers from elsewhere – but this begs the question of what complementary assets businesses and knowledge workers need.

Three key points emerge from this discussion. First is that many of these intangible assets are open to local 'construction' – manipulation, encouragement and sponsorship. The second is that local organisations and networks are of fundamental importance in marshalling a region's people and intangible assets. 'There is strong emphasis on institutions, particularly on partnership between public and private actors and networks of knowledge-sharing and cooperation' (Keating et al., 2003, p. 18). The third point to emphasise is the 'uniqueness of place' in terms of knowledge assets, history and institutions etc. What we draw from the expansive literature on social capital is the need to assess trust and the strength of networks and relationships within a *specific context,* e.g. the provision of capital, which we can view as a 'service chain'. Secondly, regional governance in most countries lacks the 'panoply of coercive powers' of nation-states with power relying far more on 'steering and concertation' (Keating et al., 2003, p. 38).

One element of innovation is anticipation of and response to the opportunities (and threats) of change. This is encapsulated by the term 'learning region' which emphasises both the dynamic nature of innovation and competitive advantage, and the need to diffuse innovation and learning throughout the actors in the region.

> The locality or region is seen not merely as the location of productive activities but *as a productive system itself* [our emphasis], able not only to exploit new conditions but to innovate and learn, so continually adapting and improving its productive apparatus; this is the learning region. (Keating et al., 2003, p. 17, citing Morgan, 1997)

In this sense, the concept of 'learning region' is an extension of the concept of a 'learning organisation', which Senge (2006) describes as 'continually expanding its capacity to define its own future'. In our work with Wollongong, we are concerned both with the adoption of innovative services by local government and the embedding of local organisations in connected 'learning regions'.

4. Approaches to assessing 'constructed advantage' and local innovation systems

As Keating et al. (2003) conclude, 'we still know too little about just how and why particular regions develop the social preconditions for successful development' (p. 19). Various approaches have been used to investigate the success factors for regions that have achieved economic renewal and to assess the capabilities and gaps in regions wishing to achieve greater innovation and learning among businesses and organisations.

In planning the research program, we carried out a brief methodology review of the regional innovation literature. We surveyed the types of methodologies used in the literature by researchers mainly in Europe and North America to assess the performance of local innovation systems and the organisations and social capital that contribute to these local systems. We asked: 'what methodologies can be used to identify organisations which are important in contributing to regional innovation?' In particular, we looked for empirical studies investigating local organisations which contribute to constructing advantage – from universities, public and industry research institutes to sport clubs, schools, *ad hoc* alliances and hybrid organisations. The material basis for the review was a bibliographic database of around 20 papers mostly focusing on European studies. The review was focused on answering the following questions:

- What methods were used in the paper to *identify* the regional organisations?
- What were the *actors* under study?
- Which organisations have been picked as a *starting point* for the empirical work, and why?
- What questions have been asked from the parties under study?

We use the classification developed by Todtling et al. (1999) to identify innovation systems in different regions. Based on data from questionaries returned by 833 firms Todtling et al. (1999) examined several European regions in regards to their innovation activities and networking of firms. Regions were identified as 'firm-based innovation systems' where inter-firm relations were the most important. Regions where universities and research organisations were more important were termed

‘science based innovation systems’. A third category of ‘policy-based systems’ was assigned to regions where there was a stronger role taken by technology centres, regional agencies and other policy actors.

Table 2 summarises the reviewed papers in terms of their match within this framework. The table also provides information regarding the methodologies applied by the paper (e.g. whether empirical or not) and details if available.

Velho, (2005) takes a mapping approach towards the social actors in innovation systems at the national, regional and cluster level. He is ‘concerned with identifying the participant social actors, mapping the knowledge flows among them, identifying bottlenecks among them and suggesting remedial actions.’ He then studies the different actors in the supply and demand side of the innovation system in different countries. Koschatzky (1999) looks at innovation networks of firms in German regions. He uses data from a German regional innovation survey in order to investigate networking in the innovation process. The sample consists of 1800 manufacturing firms and 840 service firms. The result shows that innovation intensive firms are more active in interregional networking than less innovative firms. Service firms rely more on external knowledge sources comparing to manufacturing firms, which mostly network out of the region through their customers. But the firms’ relationship with their suppliers and with universities and research organisations is mostly limited to the regional level (due to the importance of face to face meeting regarding transfer of tacit knowledge). Couchman, McLoughlin, & Charles (2008) compare the policy initiatives in two regions: Newcastle Science City (UK) and the Pacific Innovation Corridor (Queensland, Australia). They review the different actors

involved and the policies encouraging the economic development. They conclude that despite their obvious historic and contextual differences, the initiatives are based on similar policies and required a complex set of interactions between different levels of government: local, regional, state and national.

Koch & Stahlecker (2006) analyse the connections between the regional economics and institutional structure and the foundation of Knowledge Intensive Business Services (KIBS) in three German regions. Semi-structured personal interviews were conducted with relevant actors in the respective regions. Interviewees from two groups were chosen: on the one hand, experts from the economic sector, science, and (regional) administration, and, on the other hand, founders of KIBS. The principal aims were (1) to obtain deeper insights into the internal structure of the KIBS sector and its linkages and interdependencies with the (regional) economy, and (2) to acquire a profound picture of the region-specific circumstances. The interviewees in all regions confirmed that the pattern of firm foundations in the KIBS sector is closely interwoven with the regional economic, technological, and institutional set-up.

At a broader level, the European Commission set up the Innovating Regions in Europe (IRE) Network in the mid 1990s to exchange experience and good practice in the European regions aimed at increasing their capacity to support innovation and competitiveness among firms in the regions by strategies and schemes involving the development and implementation of regional innovation (Garrett-Jones et al., 2007; Innovating Regions in Europe, 2007a, b). The core activity of the IRE Network is the Regional Innovation Strategy (RIS) Projects that allow regions to enhance innovation by thoroughly analysing their current innovation systems and making decisions on

strategic priorities. The RIS Projects involve five steps: 1. initiating regional dialogue; 2. direct involvement of all relevant organisations in shaping innovation policy; 3. analysis of regional innovation needs and capacities; 4. selection of priorities for innovation support; and 5. development of action plans and pilot projects. The IRE offers a generic methodology for the RIS projects across different EU regions. Adopting our analytical framework, their approach may be classified as a firm-based view of the regional innovation systems. To initiate the regional dialogue between the firms and other regional actors they suggest examining the linkages between firms and other regional organisations such as different levels of government, other firms, investors, S&T infrastructure providers, labour organisations, and intermediaries. To develop the methodology in more details, they recommend the application of desk research, analysis of annual reports, questionnaires (paper and electronic versions), telephone-based interviews, face-to-face interviews, and workshops. They also provide in-detail suggestions regarding each method which is available in IRE presentations.

The summary of our methodology review (Table 2) shows that relatively few papers include new empirical work. In studying regional organisations these papers relied solely on literature reviews or comparative studies of empirical work provided by other research papers. On the other hand, several of the reviewed papers propose empirical methods: firm-based surveys, interviews, and workshops proved to be the most favourable methods.

Although we could find several papers approaching the regional innovation systems as ‘firm-based’ systems, we were unable to fill the ‘science-based’ and ‘policy-based’

cells of our matrix of analysis. Hence, we recognise a visible gap in the regional innovation literature which overlooks the role of science and technology producers and policy actors while over-emphasising the business enterprises and the networks shaping around them.

It is also possible to classify the methods as ‘macro’ models – innovation surveys, IRE surveys etc, and ‘micro’ models - case studies or cluster studies examining local organisations, path dependency, history, and leadership etc. Case studies are often *retrospective*, attempting to explain factors leading to success or failure. The more macro approaches may be used *prospectively* to identify strengths, weaknesses and gaps in local innovation systems. In the case of the IRE approach, this represents a major investment of resources, assisted by partner regions that have experience with the methodology.

4.1 A ‘meso’ methodology

In an earlier paper we started to propose a ‘meso’ framework for assessing constructed advantage in local innovation systems, based upon a broad review of the literature on learning regions and our observations about the variety of ‘community innovation organisations’ (Garrett-Jones et al., 2007). The framework consists of a series of ‘actors’ and of ‘assets’ (Figure 2).

Actors

The ‘standard’ players in innovation systems are well known: firms, universities and research agencies, government programs, capital markets etc. (e.g. Figure 1). In our view, this does not capture the complexity and variability of local innovation players, particularly in relation to ‘intermediaries’ and the many roles of different layers of government. Some of the players in these networks and intermediaries are obvious – major industries, chambers of commerce, business groups, universities and government agencies at all levels. Others are less noticeable – charities, sporting clubs, business services, schools and colleges and individuals – but nevertheless may be significant in particular contexts.

Our categories of local ‘actors’ complement and augment the ‘standard’ NIS framework. In particular we define a class of ‘community innovation organisations’ (Garrett-Jones et al., 2007) using the following criteria. (1) They focus on a defined geographical region. (2) They encourage broad membership, not only of businesses and/or policymakers, but a broad community of regional decision makers; businesses and business organisations; university and education leaders; healthcare leaders; ‘civic officials’; non-profit organisations; government research institutions, local industries, university instructors, higher education leaders, and youth groups (de La Mothe et al., 2006). At their core they represent a partnership between a city/region, university and chamber of commerce. (3) They are not government bodies, in that they are not generally initiated or formed by (federal/State) government. (4) They rely on their members’ funds and may or may not be financially supported by government. If government funds are used, they do not dominate; rather, they take the form of ‘member contributions’ or underwrite specific agreed functions or projects. (5) They

take on a very wide range of functions from advocacy to planning and funding local initiatives and activities. The other element that is missing from the 'standard' NIS model is the complex interplay between different levels of government. This is a serious issue in Australia's federal system (as the government memberships of 'Advantage Wollongong' demonstrate).

Assets

The assets are simply a list of the factors which appear important in a wide range of situations in constructing local advantage (Garrett-Jones et al., 2007). These local assets can be characterised under five broad headings: infrastructure (physical and 'smart' such as networks), leadership, capital, people and learning systems. The assets framework can be used to carry out a 'gap analysis' in particular regions, recognising of course that not all assets will carry the same importance in each region.

Activities (or service chains)

A further extension to the framework will be to add context specific 'activities' which we may term service chains. These may include services such as provision of risk capital, vocational training, or less tangible activities such as provision of regional strategy or leadership. This reflects the idea that 'soft services are considered the key to the modern performing, learning region' (Keating et al., 2003, p. 18). Key elements included in 'soft services' are investment in human capital (education, training, skills upgrading), R&D, inward investment, and endogenous development and entrepreneurship (Keating et al., 2003). These factors are already included in our list of 'assets'.

The important point about these activities is that they are not necessarily associated with the same actors or groups of actors in different regions. Actors are substitutable; we can accept understudies! So what is important is not whether a bank provides venture capital, for example, but whether risk capital is available from any source in the system (e.g. regional government or large firms). Likewise, regional leadership may come from a dominant firm or industry sector in the region, from knowledge organisations like universities and government labs, or from the political or governmental sector. Equivalent leadership roles may be adopted by quite different organisations in different regions, depending on the economic, cultural and institutional history of the region. What we are saying then is that the core set of assets required is likely to be common across regions, but that the actors may and will be quite different, and therefore *activities* (= actors x assets) will also differ. By comparing the common assets and not being diverted by the exact structure of the actors we offer a model which we hope is flexible but provides a framework for comparing different regions strengths in constructing advantage.

5. Further work

In Australia, as elsewhere, local government is under significant pressures to deliver optimal service performance to their community and to develop and deploy appropriate innovation strategies that create regional advantage. As we have noted, in some regions, social capital has been built by new hybrid coalitions or consortia acting at arm's length from the big government, higher education and industry players. These new organisational intermediaries contribute to forming 'patterns of interaction' between different regional actors by reducing uncertainty, encouraging cooperative innovative activities, and creating trust. In the case of Wollongong, for

example, ‘Advantage Wollongong’ displays some, but not all, of the characteristics of a community innovation organisation, as do some of its constituent members.

We are currently negotiating with Wollongong City Council and Advantage Wollongong over a series of joint research projects. The projects will involve an investigation of and action towards creating regional learning and innovation capability through service chains. The focus is on the development of social capital within such organizations and to create ‘communities of learners’ which spawn higher levels of local collaboration and productivity and innovative inter-organizational work practices among participants. The project will emphasise the coordination of the region’s intangible assets: education, research, knowledge and skilled labour. This reflects the economic rise of intangible goods and services and exchange of knowledge through intangible service chains. Initial candidates for study are the approval processes for new developments, industries and smart infrastructure; the provision of risk capital in the region; and regional vision and leadership.

Through these projects we hope to assist in overcoming the rather uncoordinated and inattentive approach to regional innovation systems (despite some nascent federal government initiatives) that currently pertains in Australia.

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Table 1: Organizational members of 'Advantage Wollongong' (Nov. 2008)

JBA Urban Planning Consultants	Business
Wollongong City Centre Ltd	Business
KPMG	Business - MNC
Hartgerink Media Services	Business - SME
Tourism Wollongong	Business Group - Local
Property Council of Australia	Business Group - National
Australian Industry Group (Ai Group)	Business Group – National
Illawarra Business Chamber	Business Group - Regional
University of Wollongong	Education – Higher education
Innovation Campus, University of Wollongong	Education - Higher Education/Soft Infrastructure
Illawarra Institute of Technical and Further Education	Education – Vocational and post-secondary
Regional Development Australia (RDA) Illawarra (formerly the Illawarra Area Consultative Committee)	Government - Federal ('locally managed, non-profit, community-based organisation funded by the Australian Government'; 16 Illawarra businesses and community leaders)
Shellharbour City Council	Government - Local
Wollongong City Council (chair)	Government - Local
NSW Department of Premier and Cabinet	Government - State
NSW Department of State and Regional Development	Government - State
Port Kembla Port Corporation	Government – State - Business/Hard Infrastructure
Illawarra Regional Development Board	Government - State (Dept. of State and Regional Development)
State Training Services Illawarra	Government State /Soft Infrastructure
South Coast Labour Council	Labour Group - Regional
Members of Parliament or their offices (4 Federal, 3 NSW State)	Parliamentarians
Illawarra Regional Information Services	Research Organization – supported by University of Wollongong, local, state and federal governments

Table 2: Methods and data sources used in some regional innovation studies

Author, Year	Regions under study	Type of RIS	Methodologies	Empirical work?
Todtling and Kaufmann (1999)	Several regions across EU: Baden-Wurttemberg, Styria, Wales, Tampere	Provides an analytical framework. Work on mostly firm-based systems	Questionaries Data returned by 833 firms	Yes: Questionnaire (no details provided)
IRE: reports on RIS projects	Number of different EU regions	Firm-based		Yes. Desk research, analysis of annual reports, questionnaires (paper and electronic versions), telephone-based interviews, face-to-face interviews, and workshops
Jonsson (2002)	IDEON Science park in Lund	Firm-based	Examining the links between 15 selected firms and their linkage with Lund University and with other firms out of the Science Park	Yes: Interviews
Koch & Stahlecker (2006)	Bremen, Munich, and Stuttgart	Firm-based	Interview	Yes: Semi-structured personal interviews with: 1. Experts from the economic sector, science, and (regional) administration, and, 2. Founders of firms
Koschatzky (1999)	Several German regions	Firm-based	German regional innovation survey	Yes: Survey: sample consists of 1800 manufacturing firms and 840 service firms.
Couchman et al (2008)	Newcastle Science City in England; Pacific Innovation Corridor in Gold Coast Australia	All: looking at the networks and the triple helix relationship	Comparative study	No
Dehlstrand (1997)	Gothenburg Region	NA	Statistical comparison	No. Statistical analysis on data related to university spin-off firms and their performance.
Giuliani (2005)	NA	Firm-based	Literature review of cluster studies	No
Greunz L (2005)	European regions	NA	Quantitative methods	No
Howell (1999)	NA	NA	Literature reviews on regional innovation systems	No
Kitagawa (2005)	Japanese Regional Innovation Systems	N/A	Literature review	No
Velho (2005)	Latin American regions	Looks at all 3	Mapping: S&T policy institutions, S&T policy performers, enterprises and NGOs	No: A review of surveys on LAC innovation systems. Details of mapping not given.

Figure 1: Regional organisations network (IRE, 2008)

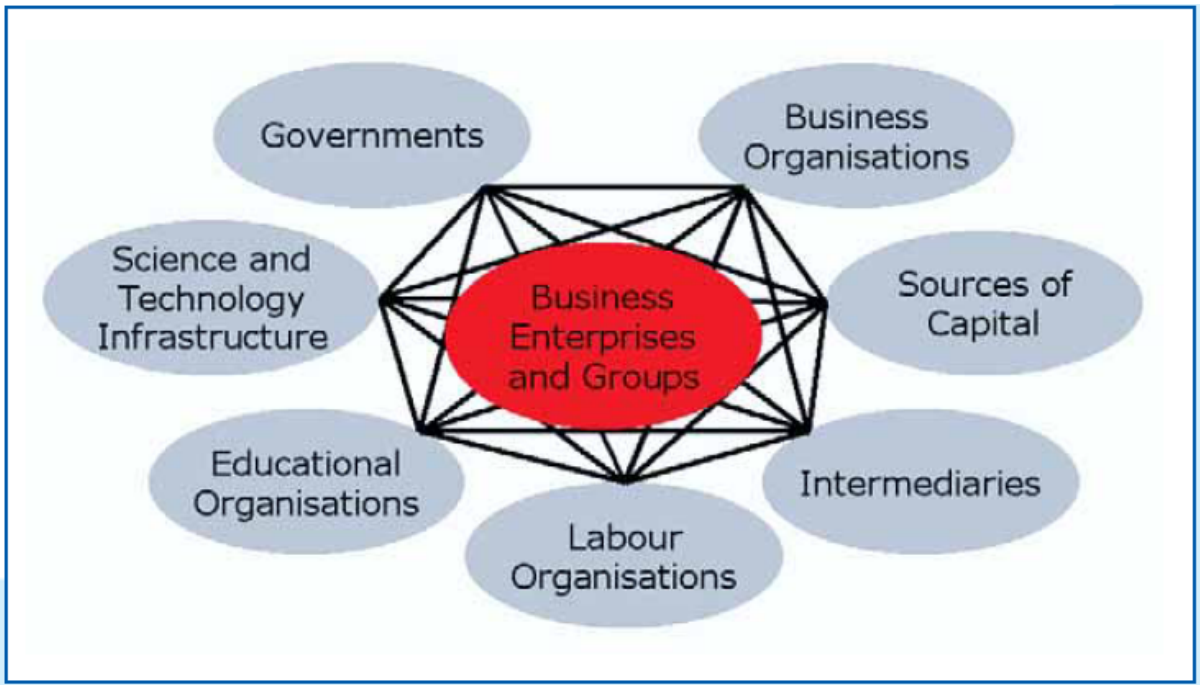

Figure 2: Institutional actors and assets in local innovation

Regional advocacy groups (voluntary collaboratives)	Regional leadership institutions, community agencies	Regional governance	Regional business consortia	National intervention and intermediaries
		ACTORS		

1. Infrastructure	2. Leadership	3. Capital	4. People	5. Learning
a) Physical ('hard') and institutional ('soft') b) 'Smart' – connectivity and networks. Linkages (regional/national) ('soft')	a) Across sectors b) Engagement, debate, branding c) Vision, community vision, 'regional foresight'	a) Local b) Inbound	a) Networks, learning, access to expertise b) Quality of life	a) Exemplars, best practices b) Sectoral networks; identification of potential sectoral bases on which to build (Cooke, 2002)
		ASSETS		

Source: (Garrett-Jones et al., 2007) after (Cooke, 2002 ; de La Mothe et al., 2006; Gertler & Wolfe, 2004, Langford, Tyrie, & Peace, 2002; Wegener, 2001).

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